Cool Suit

It gets pretty hot in a racing car. The powerful engine is, of course, the big heat contributor but there are other factors, such as aerodynamic design measures that detour cooling air away from the cockpit. Temperatures in the cockpit of 130-140 degrees Fahrenheit are not unusual and an actual thermometer reading at one race last year showed an astonishing 215 degrees. At such temperatures, driver's elevated body temperatures can cause fatigue, dehydration and even collapse.

So more and more drivers are taking to "cool suits"—helmet liners and/or body vests through which a fluid circulates, cooled by a refrigeration unit and pumped through tubes to the garments. At lower right, Ayrton Senna, winner of the 1986 Detroit Grand Prix is tightening a helmet liner while a member of the pit crew attaches the connection to the cooling unit. In the upper photo, Dale Earnhardt, 1986 NASCAR Winston Cup champion, shows off his cool vest. Their Carlson Personal Cooling Systems, which are based on aerospace technology, are supplied by Carlson Technology Inc., Livonia, Michigan, a company that specializes in customized cooling systems for auto, boat and airplane racing teams.

Motor racers tried for years to find an effective method of body cooling but early systems were unreliable and too heavy and bulky for race car use. Dennis Carlson, president of Carlson Technology, sought to develop an effective system after a driver blacked out in the 1978 Brazilian Grand Prix. He learned of cool suit research performed by Ames Research Center and a contractor, Acurex Corporation. Under contract to Ames, Acurex developed a heat-stress alleviating liquid-cooled helmet liner for military pilots after a series of accidents in Vietnam had suggested heat exhaustion as the cause. The system, which pumped a cooled fluid through channels in the helmet liner, proved effective in eliminating 40-60 percent of stored body heat.

In 1980, William Elkins, a key developer of the cooling system as an Acurex employee, left the company to form Life Support Systems, Inc., Mountain View, California. LSSI supplies helmet liners and vests to Carlson Technology. The latter company customizes a complete interior cooling system, including hardware, controls and other components tailored specially to the requirements of the user. Acceptance of the Personal Cooling System is growing, says Dennis Carlson, as is the number of success stories. Last year the winners of 12 major racing championships used Carlson cooling systems; in one race alone—the 1986 Talladega 500—there were 24 Carlson systems in use, compared with five in the prior year. ▲

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